

Appl. No. 10/689,402

Remarks / Arguments

Claims 1 to 24 and 34 to 37 are pending in the present patent application. Claim 34 has been amended, without prejudice. Support for the amendment to claim 34 is found in Applicants' specification such as, for example, at page 9, paragraph [0018].

Applicants' disclosure has been amended to correct an obvious error. In this regard, structure II has been amended such that the propylene oxide repeating units are more clearly defined. Support for these amendments is found throughout Applicants' specification such as, for example, at page 9, paragraph [0018], which clearly indicate that propylene oxide "(PO)" is the intended repeating unit.

A Request for Continued Examination under 37 C.F.R. § 1.114 is concurrently submitted with this Reply along with the appropriate fee.

The Action includes rejections under 35 U.S.C. §§ 102(b) and 102(e). In view of the remarks that follow, reconsideration and withdrawal of the rejections are requested respectfully.

Telephonic Interview

Applicants would like to thank Examiner Carrillo for the opportunity of a telephonic interview with Applicants' representative, Joseph Rossi, on May 15, 2006. During the interview, the scope of claims 34 to 36 was discussed in view of the Examiner's comments on pages 4 to 5 of the Action. Mr. Rossi disagreed respectfully with the burden assigned to the Applicants with respect to their position that the claimed invention distinguishes over the prior art of record because of the transitional phrase "consisting essentially of." Mr. Rossi and Examiner Carrillo agreed that the Applicants' burden is to show that the additional

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components disclosed in the prior art **would** materially change the characteristics of Applicants' invention (see, MPEP § 2111.03 at page 2100-53 (Rev. 2, May 2004)).¹

It was also agreed that, for the sole purpose of advancing prosecution of the present application, Applicants would amend claims 34 to 36 such that post-CMP processed substrate with a process solution **consisting of** an aqueous solvent, a non-aqueous solvent, and about 10 ppm to about 500,000 ppm of at least one surfactant having the formula (I) and (II). Applicants expressly reserved the right to present the broader claims 34 to 36 (*i.e.*, including the "consisting essentially of" recitation) in a continuation application so that Applicants will have the opportunity to collect the necessary data to meet their burden.

Discussion of the Rejections Under 35 U.S.C. § 102(b)

Claims 34 to 36 have been rejected under §102(b) as allegedly being anticipated by U. S. Pat. No. 6,310,019 to Kakizawa et al. ("the 019 patent"). Applicants respectfully traverse this rejection because the 019 patent does not disclose each and every element of the claimed invention. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ.2d 1051, 1053 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.").

Applicants' claimed invention defines a method for treating a post-CMP processed substrate comprising the steps of (1) providing the post-CMP processed substrate comprising a semiconductor material; and (2) contacting the post-CMP processed substrate with a process solution **consisting of** an aqueous solvent and a non-aqueous solvent and about 10 ppm to about 500,000 ppm of at least one surfactant having the specified formulas (I) and (II) (*see, e.g.*, claim 34). Significantly, the process solution of Applicants' claimed

¹ The burden was incorrectly characterized by the Action as requiring Applicants "to show that the additional component would **not** materially affect the basic and novel characteristics of the instantly claimed invention" (Action at 4).

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invention consists of **three** components – an aqueous solvent (*i.e.*, water), a non-aqueous solvent, and a surfactant component selected from formulas (I) and (II).

The 019 patent, in contrast, is directed to a process for cleaning a post-CMP processed substrate with an alkaline-containing cleaning agent. Significantly, the 019 patent teaches that the cleaning compositions disclosed therein include a quaternary ammonium compound (*see, e.g.*, the 019 patent at col. 2, line 63 to col. 3, line 8; col. 7, line 27 to col. 11, line 30; and claim 1). Since the compositions of the 019 patent include a quaternary ammonium compound, the 019 patent does not teach or suggest Applicants' claimed invention, *i.e.*, a process solution that consists of **three** components – an aqueous solvent (*i.e.*, water), a non-aqueous solvent, and a surfactant component selected from formulas (I) and (II). Thus, for at least this reason, the 019 patent does not teach each and every element of Applicants' claimed invention.

Claims 34 to 36 have also been rejected under §102(b) as allegedly being anticipated by U. S. published patent application No. 2004/0149309 to Hsu et al. ("the Hsu publication"). Applicants respectfully traverse this rejection because the Hsu publication does not disclose each and every element of the claimed invention. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ.2d 1051, 1053 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.").

Applicants' claimed invention defines a method for treating a post-CMP processed substrate comprising the steps of (1) providing the post-CMP processed substrate comprising a semiconductor material; and (2) contacting the post-CMP processed substrate with a process solution **consisting essentially of** an aqueous solvent and a non-aqueous solvent and about 10 ppm to about 500,000 ppm of at least one surfactant having the specified formulas (I) and (II) (*see, e.g.*, claim 34). Significantly, the process solution of

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Applicants' claimed invention consists of **three** components – an aqueous solvent (*i.e.*, water), a non-aqueous solvent, and a surfactant component selected from formulas (I) and (II).

The Hsu publication, in contrast, discloses cleaning compositions for cleaning photoresist and plasma ash residues from microelectronic substrates. In the first instance, the cleaning compositions of the Hsu publication are for use as a cleaner for photoresist and plasma ash residues from microelectronic substrates. Significantly, this is a difference process from that defined by Applicants' claim 34, for example, which recites a method for treating a post-CMP processed substrate. Indeed, photoresist and plasma ash residues are quite different substances from the post-CMP residues removed by the process solution of the present invention.

Moreover, the cleaning compositions of the Hsu publication include a non-HF producing fluoride salt as an essential component (*see, e.g.*, the Hsu publication at page 2, paragraph [0012]; and claim 1). Since the compositions of the Hsu publication include a non-HF producing fluoride salt as an essential component, the Hsu publication does not teach or suggest Applicants' claimed invention, *i.e.*, a process solution that consists of **three** components – an aqueous solvent (*i.e.*, water), a non-aqueous solvent, and a surfactant component selected from formulas (I) and (II). Thus, for at least these reasons, the Hsu publication does not teach each and every element of Applicants' claimed invention.

Claims 34 to 36 have also been rejected as allegedly being anticipated under 35 USC § 102(e) by U.S. Patent No. 6,641,986 to Zhang ("the 986 patent"). Applicants respectfully traverse this rejection because the 986 patent does not disclose each and every element of the claimed invention. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ.2d 1051, 1053 (Fed. Clr. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.").

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Applicants' claimed invention defines a method for treating a post-CMP processed substrate comprising the step of providing the **post-CMP processed substrate** and contacting the post-CMP processed substrate with a process solution consisting of an aqueous solvent, a non-aqueous solvent, and about 10 ppm to about 500,000 ppm of at least one surfactant having the formula (I) and (II) (*see, e.g.*, claim 34).

The Action mistakenly alleges that the 986 patent inherently discloses the limitations of a post-CMP processed substrate since the 986 patent teaches "treating substrates having low-k dielectric materials, which are formed as a result of a CMP process" (Action at 3-4). The 986 patent, however, is directed to a completely different stage of the semiconductor manufacturing process and, therefore, is incapable of inherently anticipating the present invention.

In this regard, the 986 patent is directed to the **pretreatment** of a substrate with a surfactant solution to alter "the character of the surface [of the substrate] from a more hydrophobic nature to a more hydrophilic nature, thereby facilitating the subsequent coating of a hydrophobic organic material such as a resist or **low-k dielectrics**" (the 986 patent at col. 8, lines 7 to 11) (emphasis added). Indeed, Applicants' claimed invention is directed to a method for treating a post-CMP processed substrate, which occurs **after** the deposition of low-k materials. Thus, since the 986 patent's disclosure is directed to the pretreatment of a substrate at a time period that is substantially before the substrate is CMP processed, the 986 patent is incapable of inherently anticipating the invention defined by Applicants' claims 34 to 36. Accordingly, reconsideration and withdrawal of the rejection are requested respectfully.

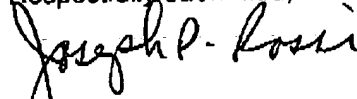
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Conclusion

Applicants believe that the foregoing constitutes a complete and full response to the Action of record. Applicants respectfully submit that this application is now in condition for allowance. Accordingly, an indication of allowability and an early Notice of Allowance are respectfully requested.

The Commissioner is hereby authorized to charge the fee required and any additional fees that may be needed to Deposit Account No. 01-0493 in the name of Air Products and Chemicals, Inc.

Respectfully submitted,



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